

# **DRAFT RESIDENTIAL SOILS AND INTERIOR DUST SAMPLING AND ANALYSIS PLAN ANNOTATED OUTLINE – COMMUNITY SOILS OU**

## **1.0 INTRODUCTION**

- This Community Soils (CS) Operable Unit (OU) Sampling and Analysis Plan (SAP) identifies the sampling and analytical procedures that will be employed when sampling both residential soils and interior/attic dust within the CS OU.
- The scope of this CS OU RA SAP is to sample all residential yards that were previously sampled (between 2002 and 2010) under the original CSOU program with existing data showing exceedance of 400 ppm lead concentrations.
- Residential yards that were previously remediated under the CSOU program are not subject to sampling under this SAP.
- The sampling will be conducted to determine those residences that will be subject to remedial action (RA) for lead (on a component-specific) and arsenic (on an area weighted average) basis.
- Interior and attic dust will be sampled for arsenic and lead analyses only when requested by a landowner and only when an exposure pathway to the attic is identified. Homes constructed after 1980 will not be subject to interior or attic dust sampling.

## **1.1 Purpose and General Objectives**

- The purpose of this CS OU RA SAP is to outline sampling procedures for residential soils and interior and attic dust RA investigations for the CS OU Area of Concern as outlined in the 2013 CS OU ROD Amendment.

## **1.2 Study Area Location**

- As outlined in the 2013 CS OU ROD Amendment, the Area of Concern consists of the Anaconda-Deer Lodge County Superfund Planning Area Overlay District (SPAOD), and specifically focuses on residential yards previously sampled under the original CSOU program with existing data showing exceedance of 400 ppm lead concentrations.

## **1.3 Previous Residential Soils Investigations**

- Residences that were sampled under previous CS OU activities that did not result in RA work will be resampled under this SAP (pending landowner request and subsequent receipt of access agreements from landowners).
- Residences that were sampled and received RA work under the original CS OU program will not be subject to resampling under this SAP

- Two lead in soil data sets exist, including: screening-level lead data from past samples analyzed specifically for arsenic (2002 through 2009 samples analyzed via XRF, with less than 100% lead data recovery); and the 2007 EPA Subsurface Investigation data set (analyzed via ICP).
- The existing lead data sets will be used to prioritize sampling efforts. Those residences with lead results above 400 ppm within any component of the yard will be sampled earliest on the schedule.

## **2.0 RESIDENTIAL SOILS FIELD SAMPLING PLAN**

- Composite samples will be collected to be consistent with the EPA's *Superfund Lead-Contaminated Residential Sites Handbook*.
- Residential soil samples will be collected at 6 inch depth intervals from 0 to 12 inches bgs.
- Soil samples from unpaved alleys will be collected at 6 inch depth intervals from 0 to 6 inches bgs.
- Where possible, the previously delineated and approved CS OU residential yard components will be utilized.
- For Regional properties, the yard area will be defined as a maximum of 125 feet from the center of the residence, unless a property boundary or natural barrier (e.g., fence, hedge, tree line, abrupt change in grade, etc.) is encountered.
- The number of residential yards ultimately sampled will depend on the number of Access Agreements secured by Atlantic Richfield from the residential property owners within the CS OU Area of Concern.
- Initially, Access Agreements will be requested from all residents previously sampled under the original CSOU residential soils program with screening level lead data greater than 400 ppm. After those residential properties have been sampled AR will accept sample requests from remaining residents within the Anaconda-Deer Lodge County SPAOD.

## **2.1 Standard Operating Procedures for Sampling Activities**

- Procedures for soil sample handling, collection, and shipment are described in Standard Operating Procedures (SOPs).

### **2.1.1 Yard/Lot Maps**

- A surveyed map of each individual property will be created prior to sampling and will identify how each property has been divided into individual components.
- All subsample locations will be plotted on the map representing each residential yard.

### **2.1.2 Sample Density, Location and Compositing**

- Samples from each individual yard component will be composited in the field, and a single composite sample applicable to each identified depth interval, will be submitted to the laboratory and analyzed for arsenic and lead.
- One subsample per individual yard component will be collected unless the component is greater than 625 ft<sup>2</sup> (25 feet by 25 feet) in surface area. If the yard component exceeds 625 ft<sup>2</sup>, additional subsamples will be collected to meet the sample collection density of 1 subsample for each 625 ft<sup>2</sup> (in accordance with the SOPs).
- For gardens, earthen driveways, and source areas (areas of visible smelter-related waste material), a minimum of two subsamples will be collected regardless of the surface area involved.
- Non-drip zone samples will be located outside of the drip zone and away from influences of any other painted surfaces.
- Subsamples will be collected from drip zones. These subsamples will be included in the nearest component composite sample.
- Subsamples will not be collected from between residences if the distance between the homes is less than three feet.
- Subsamples will not be collected from beneath a tree canopy. If the yard component surrounding the tree exceeds the either the arsenic or lead action level, soil excavation under the tree canopy will be completed using hand tools.
- Composite samples will be collected from distinct play areas, gardens, and unpaved driveways. These composite samples will consist of a minimum of two subsamples collected from the corresponding depth intervals.
- Distinct “rock garden” component samples will not be collected. Subsamples will be collected from within a rock garden associated with a residence and this subsample will be included in the nearest component’s composite sample. If the component’s composite sample exceeds the arsenic or lead action level, the rock garden will be remediated along with the targeted component.
- If the EPA (or the EPA Contractor) chooses to collect split samples, an adequate quantity of soil will be made available by the sampler at the time of sample collection. However,

the EPA (or EPA Contractor) will be responsible for providing sample containers and coolers, etc.

### **2.1.3 Sample Depths**

#### **2.1.3.1 Residential Soil Samples**

- Most residential yard/lot areas are expected to be covered with grass; consequently, a surface sample will be collected from immediately beneath the vegetative mat, or in the absence of vegetation, 0 to 6 inches bgs. If a vegetative mat (sod) is present, it will be separated from the soil surface with a stainless steel knife or equivalent. The removed vegetative mat will be shaken and scraped over the sample collection bowl to dislodge any soil particles. All dislodged particles will be placed in the sample.
- Exceptions to this procedure will occur when the sample location falls on a graveled driveway or similar surface. If the surface material is coarse-grained material free of intermixed fine materials, the sample will be collected from the 0- to 6-inch soil layer immediately beneath the coarse-grained material. However, if the graveled driveway or similar surface contains soil/dust material on the surface, the sample will be collected from the surface, 0- to 6-inch layer.
- A subsurface sample from each identified yard component will be collected from the 6 to 12 inch bgs depth interval.
- Decisions regarding collection of additional “opportunistic” samples will be made in the field by sampling personnel and/or Agency personnel.

#### **2.1.3.2 Alley Samples**

- For alleys within the CS OU Area of Concern, a surface sample will be collected from 0 to 6 inches bgs. No subsurface samples will be collected.
- Subsamples within alleys will be collected from each end of the alley and at one location between the ends of the alley, resulting in 3 alley subsamples. The 3 alley subsamples will be combined into a single composite sample for each alley.

### **2.1.4 Sample Identification**

- A project specific sample identification system will be derived for CS OU Residential Soils samples.

## **3.0 INTERIOR/ATTIC DUST FIELD SAMPLING PLAN**

### **3.1 Data Collection Design and Rationale**

### **3.1.1 Interior Dust Collection**

- An interior dust composite sample will be prepared to represent three areas of each level within the residence (if space allows). These areas represent those frequented by children and include: A floor area directly inside the main entry to the residence; a floor area in the most frequently occupied room (normally the living room or kitchen); a floor area in the child's bedroom or another frequently occupied room if no children are present in the home; and additional locations will be sampled, as necessary, to obtain sufficient sample size or characterize primary exposure areas within home as determined via the resident questionnaire.

### **3.1.2 Attic Dust Collection**

- Attic dust sampling will include a composite of subsamples collected from a minimum of two separate areas within the attic to represent the entire attic.

## **3.2 Sampling Equipment and Sample Collection**

### **3.2.1 Interior Dust Equipment and Sample Collection**

- Interior living space dust samples will be collected using the High Volume Small Surface Sampler (HVS3).
- The HVS3 has been designed to collect surface dust for the study of pollutant source and migration paths for total exposure assessment. (CS3, Inc. High Volume Small Surface Sampler, Operation Manual, 1998). Two strips of masking tape will be placed parallel to each other on the area to be sampled between 0.5 meters and 1.5 meters apart and on either side of the main traffic path through the main sample area. The tape will be marked every three inches, and will extend as far as space will permit. Based on the type of surface, the HVS3 will be set to the appropriate pressure drop and flow rate. The sample collection bottle will be pre-weighed and attached to the vacuum. Sampling will begin by moving the vacuum nozzle between the ends of the two pieces of tape. The sample apparatus will be moved back and forth four times on the three-inch wide strip. After four double passes, the nozzle will gradually be moved over to the second strip. This process will be repeated until all strips have been sampled or until six grams of dust have been collected. The HVS3 will be cleaned after each residence.

### **3.2.2 Attic Dust Equipment and Sample Collection**

- In the attic spaces, it is anticipated that areas suitable for sampling may be limited and obtaining a representative sample will be more difficult. Thus, ASTM D 7144 – 05a, *Standard Practice for Collection of Surface Dust by Micro-vacuum Sampling for Subsequent Metals Determination* will be used. Attic dust samples will be collected using the Micro-Vacuum Surface Dust Sampler sampling technique. The Micro-Vacuum Sampler is designed to collect dust using a collection nozzle attached to a filter holder (sampling cassette) that is connected to an air sampling pump. Depending on

accessibility, samples will be collected from a minimum of two locations within the attic and composited into one representative sample.

### **3.3 Sample Disposal**

- Samples will be taken to a laboratory to be analyzed and will be held by the laboratory in the archive status for at least three months.

### **3.4 Sample Identification**

- A project specific sample identification system will be derived for CS OU Dust samples.

### **3.5 Sample Handling**

- Interior dust samples will be collected in a plastic collection bottle. The bottle will be sealed and delivered to the laboratory. All filters collected with the Micro Vacuum Sampler will be placed in a zip lock bag and delivered to the laboratory. Samples will be transferred and handled using established chain of custody procedures.

## **4.0 FIELD QUALITY CONTROL SAMPLES**

- Quality control samples for soil and dust sampling will be collected and analyzed according to the project specific Quality Assurance Project Plan (QAPP).

## **5.0 ANALYTICAL METHODS**

- Residential soil samples will be analyzed using the analytical methods identified in the QAPP and in general accordance with EPA's Contract Laboratory Program (CLP) protocols.
- Interior dust samples will be analyzed using ICP-MS EPA Method 6020A.
- Attic dust samples will be analyzed for arsenic and lead by EPA Method SW-3050B (sample digestion) and EPA Method 6020A Inductively Coupled Plasma/Mass Spectrometer (analysis).

## **6.0 DATA VALIDATION AND ASSESSMENT**

- CS OU RA sampling data will be data validated as outlined in the project specific Quality Assurance Project Plan (QAPP).

## **7.0 REPORTING**

- Upon receipt of laboratory results, all analytical data (soil and dust) will be uploaded into a project database. Results of this investigation will be used to develop ISWPs for residences where samples exceeded CS OU action levels.

- All RA sample results will be will be reported to each individual landowner.
- All soil and dust data will be forwarded to the Agencies for review. All ISWPs developed for the project will be forwarded to the Agencies for review and approval.

## **8.0 PROJECT TEAM/ORGANIZATION**

- Atlantic Richfield Project Manager – Luke Pokorny
- Sampling Team -- TBD

## **9.0 SCHEDULE**

- Approximately 100 residences are targeted to be sampled during the fall of 2014. The remaining residences will be sampled in subsequent years as receipt of access agreements allows.
- Interior/attic dust sampling will be conducted as landowner requests dictate.
- RA sampling activities will be initiated once sampling activities are completed and executed access agreements are received.

## **10.0 REFERENCES**